



Goddard Earth Sciences Data and Information Services Center (GES DISC)

What's NEW at the GES DISC: Evolution of data management and services for Aura mission and beyond

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Acknowledgment: Aura ST, SIPs, ESDIS EMS, GES DISC team

2016 Aura Science Team Meeting

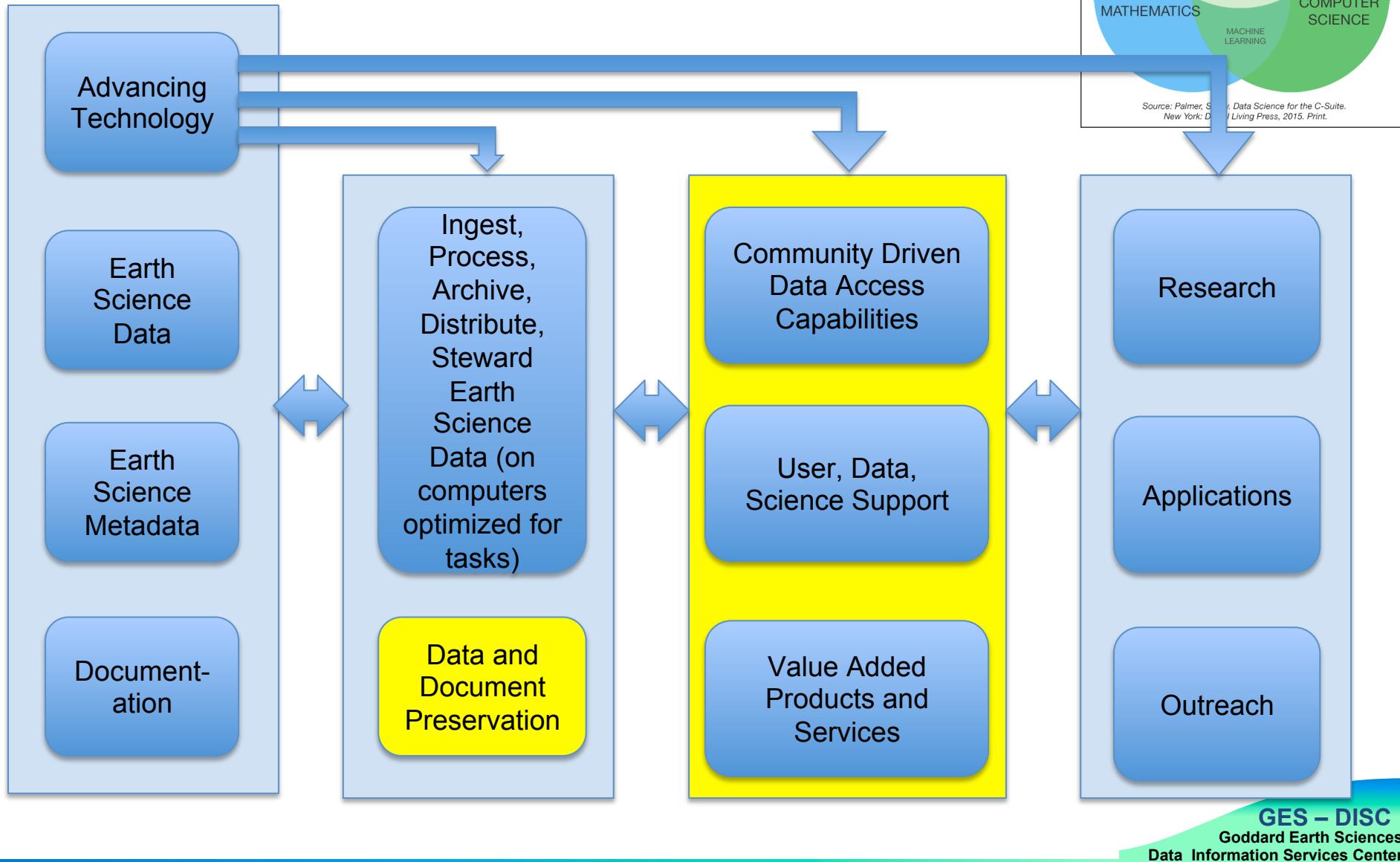


Outline

- GES DISC world
- Aura data usage and trend
- Aura data users requests
- GES DISC update (before/after)
 - New Access method (ftp → http) with Earthdata Login System
 - New Website (DISC/Mirador → New Interface)
 - New Giovanni (Giovanni → Now Federated)
- GES DISC support beyond Aura Mission
 - Multi-sensor coincident data subsets
 - Level 2 support (Subsetter, Visualization)
 - Data List



The GES DISC ‘World’





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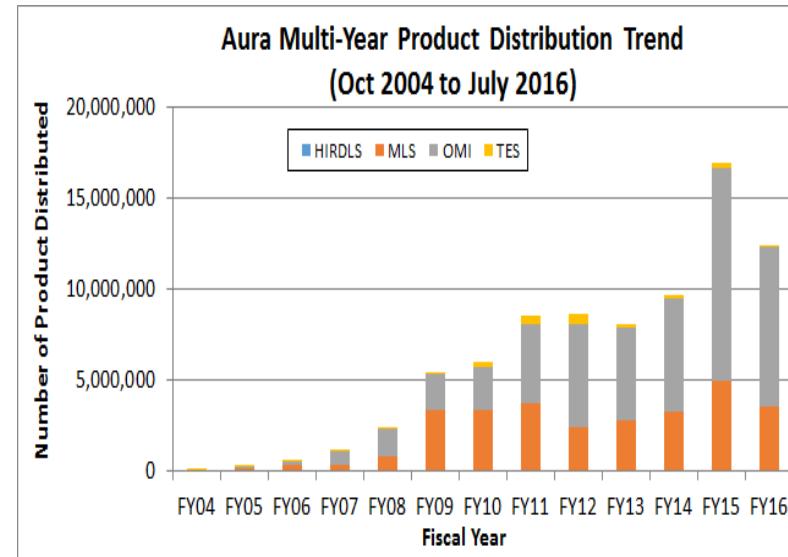
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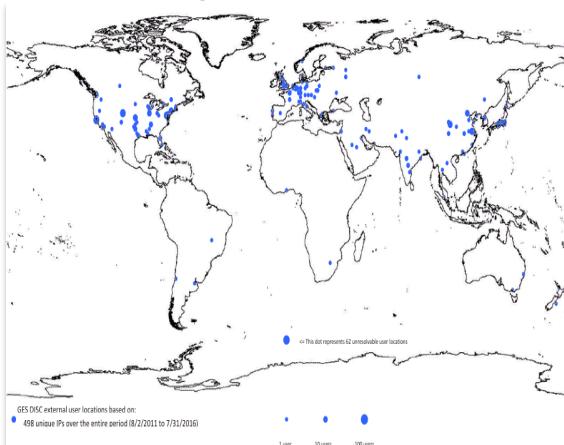
Aura Distribution by Instrument

Distribution presents the amount of data successfully distributed to user community.

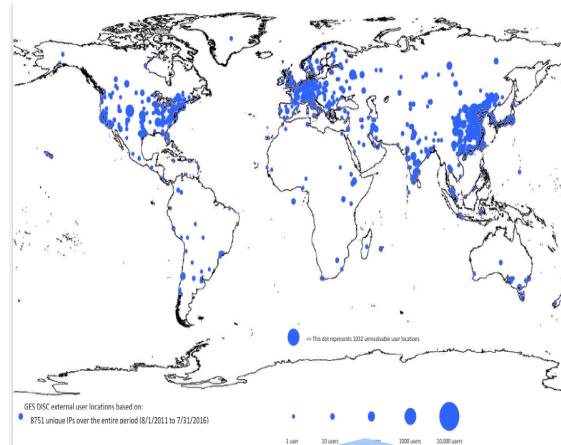
Mission	Instrument	# Files	Volume (TB)
Aura	HIRDLS	18,922	0.92
	MLS	3,420,094	25.34
	OMI	11,634,182	164.48
	TES	244,550	6.80



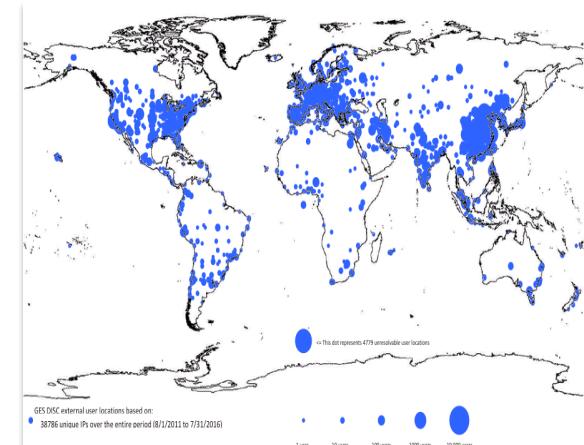
User Geographical Distribution



HIRDLS



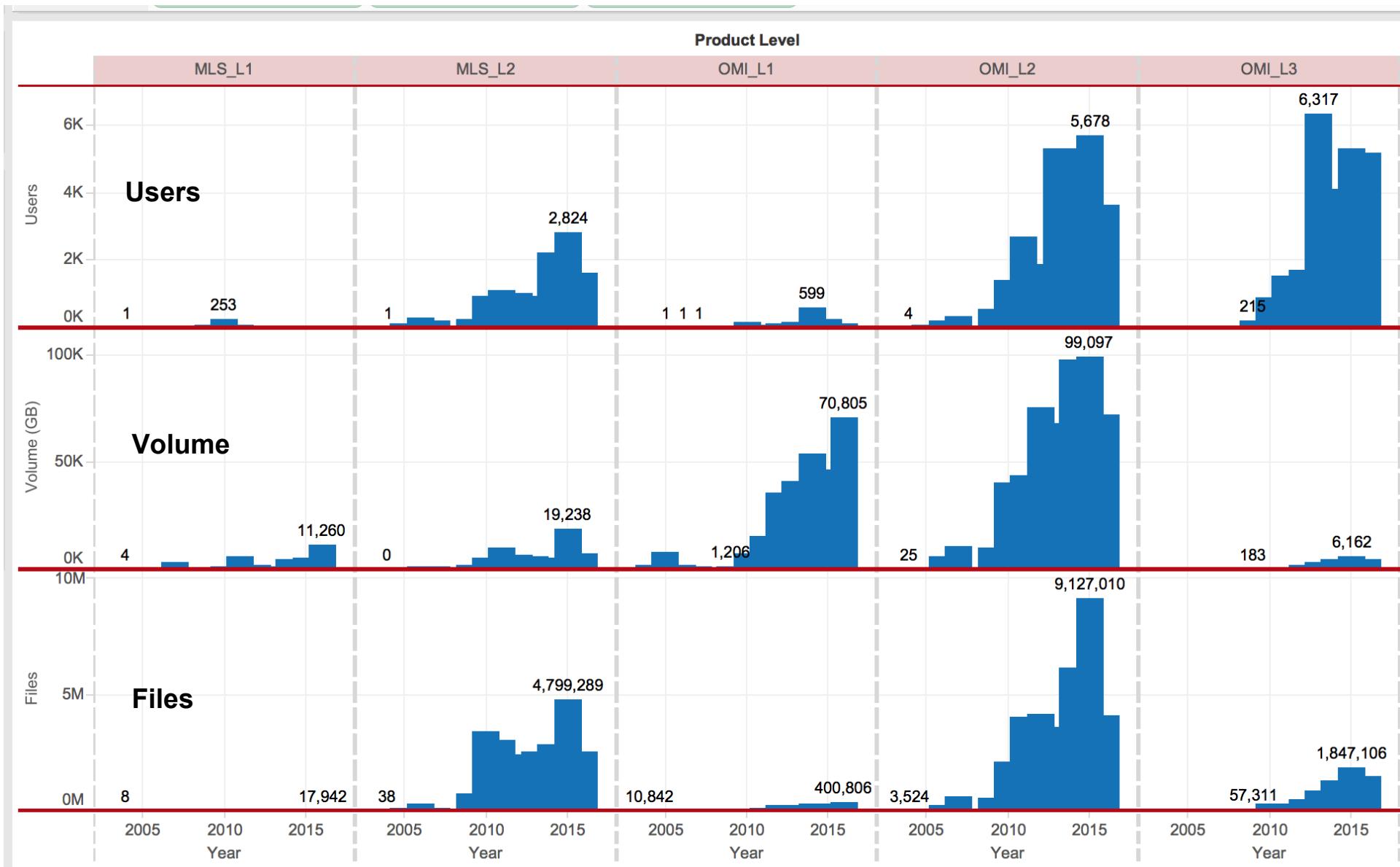
MLS



OMI



Aura MLS/OMI Data Processing Level Distribution





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Help Desk Request from Users

Find/Access/Download Data

- I do not know how to download...
- Enhance tools/services/data recipe for better data search, data access, data download

Data Subsetting

- Improve ability and performance of data subsetting tool

Data Reading

- Keep data reader code updated, more data reading recipes

Documentation and Science Question

Parameter unit, vertical layers ...

Can we use OMI data for ...? Are OMI data better than ...?

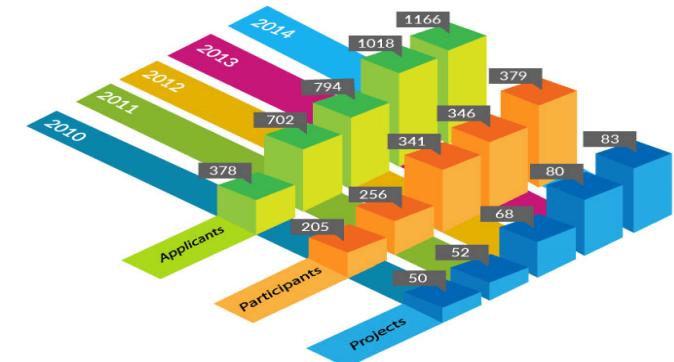
- Enhance metadata and online resources

Users help us

- Users find error in our website and code not working -> we make correction.

2007 May to 2016 Aug

Instrument	# User Request
Aura	9
HIRDLS	7
MLS	53
OMI	283
Total	352





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Transition to Earthdata Login

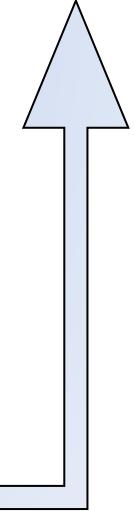


IMPORTANT MESSAGE Jun 28, 2016 Access to GES DISC data will require all users to be registered with the Earthdata Login system

Starting August 1st, 2016, access to GES DISC data will require all users to be registered with the Earthdata Login system. Data will continue to be free of charge and accessible via HTTP. Access to data via FTP will no longer be available after October 3rd, 2016. Detailed instructions on how to register and receive authorization to access GES DISC data are provided [here](#).

GES DISC Users who deploy scripting methods to list and download data in bulk via anonymous FTP are advised to review the [How to Download Data Files from HTTP Service with wget](#) recipe that provides examples of GNU wget commands for listing and downloading data via HTTP.

□ GES DISC will replace anonymous FTP with HTTP download on October 3rd, 2016



□ We have provided detail in alert message, banner, emails...

□ Problems/Questions to GES DISC Help Desk
(gsfc-help-disc@lists.nasa.gov)



GES DISC New Web Interface

EARTHDATA Data Discovery DAACs Community Science Disciplines Search

GES DISC

Aura Atmospheric Composition, Water and Energy Cycle, and Climate Variability Data Back to Classic

Data Collections Related Documentation

Refine By Showing all (143) datasets associated with **Aura** for date range **1920-01-01 to 2016-08-24** within **-180, -90, 180, 90...**

SubjectSort

- Aerosols (16)
- Air Quality (1)
- Altitude (5)
- Atmospheric Chemistry (80)
- Atmospheric Radiation (14)
- [More...](#)

MeasurementSort

- Aerosol Extinction (12)
- Aerosol Optical Depth/Thickness (11)
- Attitude Characteristics (2)
- Bromine Monoxide (6)
- Carbon Monoxide (5)
- [More...](#)

SourceSort

Image	Dataset ▼	Source ▼	Temporal Resolution ▼	Spatial Resolution ▼	Process Level ▼	Begin Date ▼	End Date ▼
No Sample Image	OMI/Aura Ozone (O3) Total Column Daily L2 Global Gridded 0.25 degree x 0.25 degree V3 (OMTO3G.003) - Atmospheric Chemistry, Atmospheric Radiation, Aerosols	Aura OMI	1 day	0.25 ° x 0.25 °	2	2004-10-01	present
No Sample Image	GOZCARDS Merged Water Vapor 1 month L3 10 degree Zonal Means on a Vertical Pressure Grid V1 (GozMmlpH2O.1) - Atmospheric Water Vapor	UARS HALOE, UARS MLS, Aura MLS	1 month		3	1991-09-01	2013-01-01

History Visible Wavelengths Platform Characteristics Instrument Characteristics

Precipitation Radar



Giovanni: More Data, More Plots, Faster Results

Old Giovanni:
40 individual Portals

New Giovanni:
Omnibus Portal (future)
• Point data (future)

2015



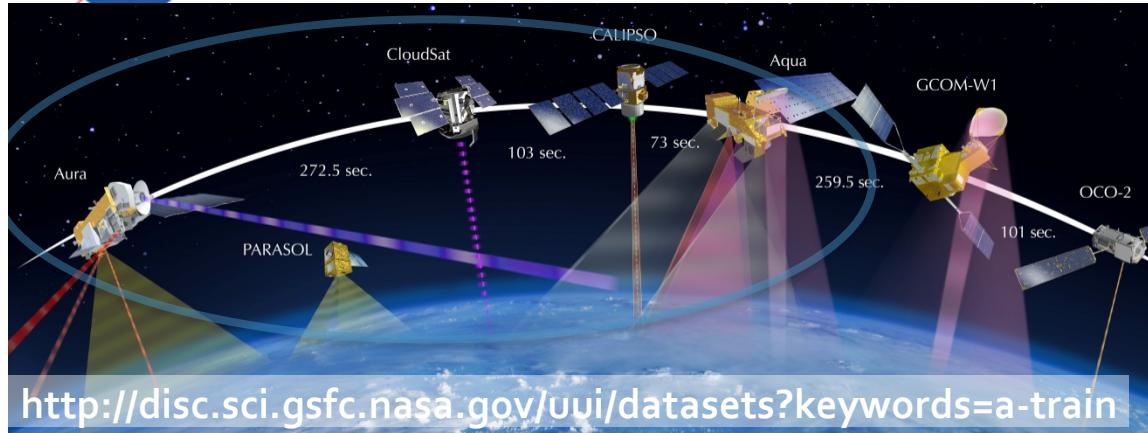
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 - Giovanni (G3 → Giovanni, open source)
- GES DISC support beyond Aura Mission
 - **A Train Data Depot (Multi-sensor coincident data subsets)**
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Multi-Sensor Collocated Subsets

Example: A-Train Data Depot (ATDD)



- A-Train Data Depot (ATDD) was supported by NASA ACCESS (Advancing Collaborative Connections in Earth System Science) program and now is on sustaining mode.
- Started with CloudSat mission support with MODIS-CloudSat collocated subsets. Building upon the expertise, OMI, POLDER, and AIRS subsets were subsequently added in production, and distributed by ATDD.
- The collocated subsets include MODIS/Aqua L1B and L2 atmospheric products, OMI/Aura L2 products, and Polder/Parasol L2 products (Table shows detail)

Archived On-line A-Train Subsets

- New Web <http://disc.sci.gsfc.nasa.gov/uu/datasets?keywords=a-train>
- <http://atrain.gesdisc.eosdis.nasa.gov/data/>

MODIS/Aqua, Level 1B, radiances

- MAC021S*: 1-km radiances
- MAC02QS*: 250-m radiances

MODIS/Aqua, Level 2, atmospheric products

- MAC04S*: Aerosol Optical Depth Land and Ocean, Aerosol Type over Land, Angstrom Exponent, Mass Concentration, Fine Mode Fraction
- MAC05S*: Water Vapor IR and near IR retrievals
- MAC06S*: Cloud Top Parameters: Pressure, Temperature, Effective Emissivity, Spectral Forcing, Cloud Phase; Cloud Optical Parameters: Cloud Optical Thickness, Effective Particle Radius; Cirrus Detection: Cirrus Reflectance.
- MAC07S*: Temperature and Moisture (dew point temperature) profiles.
- MAC35S*: Cloud Mask: IR, NIR, and CO2 tests; Visible test at 250-m.

OMI/Aura, Level 2, Cloud Pressure, Ozone, and UV index

- OMCLDO2_CPR: Cloud effective pressure based on O2-O2 absorption
- OMCLDRR_CPR: Cloud effective pressure based on Raman scattering
- OMTO3_CPR: Column amount O3, UV Aerosol Index, UV reflectivity.
- OMAERUV_CPR: UV Aerosol Index, Aerosol Absorption Optical Depth, Surface Albedo, UV Reflectivity.

POLDER/Parasol, Level 2, Radiation Budget processing

- PARASOLRB_CPR: Column Water Vapor, Cloud Pressure from O2 lines, Cloud Optical Thickness, Cloud Phase, Cloud Albedo, Clear Albedo.

*Available in 200- and 10-km swath widths; The Cloud and Earth Sciences Data Information Services Center



Multi-Sensor Intercomparison

	OMPS	GOME-2	TROPOMI
Footprints of S5P TROPOMI, Spectrometer grating, NPP OMP Spectrometers with CCD detectors, GOME-2, Aura OMI, and Envisat Schiama	5P TROPOMI, Spectrometer grating, NPP OMP Spectrometers with CCD detectors, GOME-2, Aura OMI, and Envisat Schiama	S-Double monochromator with pre-disperser prism and four holographic gratings	4 grating spectrometers with their own optics and 2-D detectors
Wavelength (nm)	NP: 250-310 NM: 300-380	Band 1: 240-315 Band 2: 311-403	Band 1: 270-300 Band 2: 300-320 Band 3: 320-405
Spectral resolution (nm)	1.0	Band 1: 0.24-0.29 Band 2: 0.26-0.28	0.5
Sample interval (nm)	0.41	Band 1: 0.12 Band 2: 0.12	Band 1 & 2: 0.065 Band 3: 0.20
Swath	Push broom 110°	Across track scanning METOP-A: 1920km & 900km (after July 2013) METOP-B: 1920km	Push broom 2600km nadir macropixel
GOME-2 band 1A pixel	FOV: 140°-150°, 74°-72°	METOP-A: 40km×80km & 40km×40km (after July 2013) METOP-B: 40km×80km	Band 1: 28x7km Band 2 & 3: 7kmx7km
Spatial Resolution	NM: 50km×50km NP: 250km×250km	EPS-native format	netCDF-4 GOME-2 near-nadir pixel (band 1B and 2B)
L1B Data Format OMPS NP Cell	HDF5		



Data Quality Level 2 Visualizer

The screenshot shows the NASA L2 Data Quality Visualization (DQViz) application interface. The main window displays a map of the Northern Hemisphere with satellite imagery. A map layer list on the right side is titled "MAP LAYERS" and includes the following categories and data types:

- MODIS**:
 - Terra Corrected Reflectance (True Color)
 - Aqua Corrected Reflectance (True Color)
- OMI**:
 - OMAERUV
 - Absorption AOD 388nm (no QA)
 - Absorption AOD 388nm (QA)
 - Absorption AOD 500nm (no QA)
 - Absorption AOD 500nm (QA)
 - AOD 388nm (no QA)
 - AOD 388nm (QA)
 - AOD 500nm (no QA)
 - AOD 500nm (QA)
 - OMAERO
 - OMSO2
 - OMTO3
 - OMDOAO3
- World Background**

On the left, a calendar for August 2016 is displayed, with August 24th highlighted. The bottom of the interface shows a coordinate reference with 50°00'W, 120°00'W, 90°00'W, and 60°00'W. A "Feedback" button is located in the top right corner.



Summary

→GES DISC is user driven data service center

- Maintain **active archive** of datasets and enhance information services by developing tools and services for users
 - **Applications Support: Earthdata Login, New Website, Subsetting, Giovanni, Data Recipe/Cookbook, OPeNDAP, ...**
 - Dataset documentation support (User Guides, Readme, FileSpec, DIF, ...)
- Engage the **user community** in their data access, data usability and information/services needs.
 - Conference & Science Team participation, outreach.
 - Help Desk/User Support.
 - Develop and test recipes, and support tools for working with GES DISC data.
- **Web content support, Social Media, User Forum**, news articles, version release information, and data services updates, FAQ.
- Support for **legacy missions & document preservation**



Operational Services/Tools

- **Giovanni** – Data Discovery, Visualization and Exploration
- **Mirador** – Data Search and access
- **Simple Subset Wizard** – GES DISC led, cross DAAC effort to provide subsetting capabilities
- **Data Recipes**
- **OpenDAP**
- **GrADS Data Server**
- **Open Geospatial Consortium (OGC) Web Map Service (WMS)**
- **Data provided in various formats** (HDF, netCDF, ASCII, kmz, others)
- **MAPSS** – Provides multi-sensor aerosol analysis centered around AERONET sites
- **Data Quality Screening** – Allows users to filter data on Quality
- **NEESPI (Northern Eurasia), MAIRS (Monsoon Asia), and A-Train Data Depot (along the A-Train track)** – Provides multi-instrument heterogeneous data access for a given region
- **Data Stewardship**